

AMNESIA

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A discussion of amnesia must involve both physiologic and psychologic concepts. The functions of which "amnesia" denotes the absence should be conceived as constituting a process for which "remembering" is an appropriate name, since it suggests activity, in preference to "memory," which suggests something passive only. Memory in this limited sense of a trace which influences subsequent reactions is something very old in the history of organisms. It is even found in non-living material of such simple structure as a gel.¹

Remembering, as I use it here, is an activity of the ego, or of the "highest level" of the organism, in Hughling Jackson's sense. "Remembering is not the excitation of innumerable fixed, lifeless and fragmentary traces. It is the imaginative reconstruction built out of the relation of our attitude towards a whole mass of organised past reactions of experience" (Bartlett²).

These reconstructions Bartlett called "schemata." It is likely that the earlier schemes follow the line of demarcation of the special senses. Thus, appetites, like food seeking and sleeping, and instincts, like fear, determine the form of the schemata. Temperament—which evidently Bartlett believed, and I agree, is best regarded as a matter of pattern of relative strengths of the appetites and instinctive tendencies—and character are next involved. There goes on all the time an unwitting analysis giving weight to certain elements, and the weighted details stand out in images. "Images are the details picked out of schemes." The use of words is determined partly by the need to communicate images from one person to another. Words and images, however, which are at first used to break up schemes, tend themselves to become automatized. Hence in pathologic conditions the ability to use words may be fully retained when no "remembering" either in the full or even in the simply mechanical sense is possible.

COMPONENT FUNCTIONS OF REMEMBERING

Remembering traditionally involves registration, retention and recall, but the total process can probably involve other functions in addition to

1. Bayliss, W. M.: Principles of General Physiology, London, Longmans, Green & Co., 1916.

2. Bartlett, F. C.: Remembering, London, Cambridge University Press, 1935.

these. One of these functions is time ordering of experience. A "time consciousness" is postulated as an important element of psychic activity by various authors, e. g., Lewis,³ who cited instances of disorder of this function in a wide variety of psychiatric conditions.

Another function is the feeling of "pastness," which pertains to experience and which appears to depend on a separate and basically physiologic function, not the same as time ordering, since it may appear as an isolated and characteristic experience in epileptic states in the form of a feeling of familiarity (*déjà vu*) for a situation which has none of the other marks of a truly remembered experience.

Whether what Bertrand Russell⁴ called the "emotion of belief" is a further separable element indispensable to a complete act of remembering or whether it arises only from the presence of all the other factors in a complete experience is a matter for speculation. An element in remembering which is certainly bound up with this "emotion of belief" is the awareness of the continuity of one's personal identity so that one can say "This happened to me"; the kind of remembering involved in saying "I visited Paris in 1925" is different from what is implied in saying "Waterloo was fought in 1815." Both are acts of remembering, but the latter is much simpler than the former. It is an example of the so-called "mechanical" type of memory, as compared with the personal type of remembering. That continuity of personal identity and mechanical memory are separate phenomena is shown by clinical cases in which mechanical memory, when tested, is found to be intact but the recollection of every-day events in the patient's life, up to a given date, is lost. This differentiation is the more convincing when not only immediate mechanical memory but the memory for things learned in the past persists, while the recollection of events with a personal origin is difficult or impossible.

Kohnstamm recorded the case of a man who had complete retrograde amnesia for personal events and retrograde amnesia for every-day events, which he forgot at once, but who could remember previously acquired data, such as the names of political parties and school knowledge, e. g., calculation. Although he forgot immediately all that occurred around him, he would retain a string of figures, which he learned in the mechanical way, often with 50 per cent accuracy, while verses which he learned could be recollected more or less the next day. In discussing amnesia, therefore, one must note that it may reflect failure at one of several levels or, alternatively regarded, may be the outcome of the falling out of one of a number of functional elements. What has been called the sensorimotor level of remembering, involving no more than

3. Lewis, A. J.: *Proc. Roy. Soc. Med.* **21**:611, 1931.

4. Russell, Bertrand: *The Analysis of Mind*, London, The Macmillan Company, 1921.

registration, retention and recall—and the latter probably in a very elementary sense—can evidently function when complete acts of remembering in the sense I have described are impossible.

Imagery of the eidetic type evidently belongs to this level of activity, but images in the sense in which they usually exist in adults are, according to Bartlett's recent analysis, the product of a much less immediate and more complex type of mental function. Hence, a rote or sensorimotor memory (e. g., ability to reproduce symbols) may persist while orientation fails, from failure to form images by abstraction from sensory experience. Thus, for example, in Korsakoff's psychosis there is disorientation but, contrary to general belief, retention tests may be fairly satisfactorily performed. The disorientation cannot, therefore, depend merely on failure of retention. Pfeiffer suggested that there is a defective comprehension of visual space—presumably the result, in Bartlett's theory of remembering, of failure to "extract" images.

If anything further is required to prove the independence of mechanical memory and memory of the more organized types, it would be Brodmann's curious case. He observed in a patient with a polyneuritic psychosis the opposite state of affairs, in which every-day personal events were recollected, while series of syllables were immediately forgotten. This illustrates the danger of regarding some processes apparently complex, such as associative recall, as necessarily "higher" than others apparently simpler, such as retention in the mechanical sense.

Remembering in the complete sense of this analysis is a personal act and depends on the following factors, which can be distinguished on the basis of a conjunction of psychologic analysis and clinical observation.

Factors in Remembering	Conditions in Which these Factors Are Interfered with or Appear in Isolation
(a) Registration	Acute organic reaction type (delirium); manic excitement (inattention); hysteria (global inattention)
(b) Retention	Organic reaction type in general
(c) Recall	
(1) simple and elementary	Organic reaction type (severe degree)
(2) As a voluntary act	Psychogenic conditions, e. g., hysteria; certain forms of organic reaction type, e. g., trauma to the head; Korsakoff's psychosis; epilepsy
(d) Time Sense	Various psychoses with depersonalization (?); Korsakoff's psychosis (amnesic symptom-complex)
(e) "Pastness"	Epilepsy (déjà vue); anesthetic states

5. Footnote deleted by the author.

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| (f) Associations determined by | $\left\{ \begin{array}{l} \text{sense organs} \\ \text{appetites} \\ \text{instincts} \\ \text{interests} \end{array} \right\}$ | $\left\{ \begin{array}{l} \text{Organic reaction} \\ \text{types in general; psychogenic} \\ \text{conditions} \end{array} \right\}$ |
| (g) Imagery ("extracted images of Bartlett) | Korsakoff's psychosis;
early senile dementia | |
| (h) Personal Identity (awareness of) | Hysteria;
depersonalization
in various psychoses | |

(a) *Registration*.—Defects in this process are not of great interest, as they are of the type of failure of attention, e. g., from distraction, as in acute mania, or of the failure of attention that accompanies any severe psychologic disturbance of cortical function, as in febrile delirium. Failure of registration of a different order, and of a curiously localized kind, may occur in hysterical conditions. The concentric limitation of the visual field is a well known example. That much that is apparently missed in hysterical subjects is actually registered was demonstrated by Morton Prince in his experiments with hypnosis and automatic writing. The failure of the hysterical person to attend and therefore to register is sometimes grotesque, as in the case of a woman who could see everything in the room but myself when she came to the hospital. Such instances can be so gross as to make incredible any symptomatic distinction from malingering. I shall return to the conception of hysteria and its relation to malingering, and the bearing of this on the problem of amnesia.

(b) *Retention*.—On the trace theory of memory failure of retention would be the most frequent and fundamental factor. But, in fact, failure in one of the other functional elements must often be mistaken for failure of retention, even in diseases in which gross physiologic alteration undoubtedly exists. For example, it has been found that a patient who has recovered from Korsakoff's psychosis may recollect events after his recovery that he did not appear to note at the time.

Korsakoff⁶ himself noted that in some patients events occurring at the time of the illness, which they did not appear to retain at the time, were recollected years after. Bonhoeffer⁷ showed in his experiments with visual impressions that what was apparently not retained at the time could be recognized later. Grünthal⁸ concluded that the apparent

6. Korsakoff, S., in Bumke, O.: *Handbuch der Geisteskrankheiten*, Berlin, Julius Springer, 1928, vol. 7, pt. 3.

7. Bonhoeffer, K., in Bumke, O.: *Handbuch der Geisteskrankheiten*, Berlin, Julius Springer, 1928, vol. 7, pt. 3.

8. Grünthal, M., in Bumke, O.: *Handbuch der Geisteskrankheiten*, Berlin, Julius Springer, 1928, vol. 7, pt. 3.

failure of retention results from difficulty in evocation of engrams, i. e., difficulty in recall on account of poverty of associations. I have suggested that the disorientation of a patient with Korsakoff's psychosis may result, according to Bartlett's analysis, from failure to extract images. But one must also agree with Meggendorfer that there is actually a defect of pure retention in any severe amnesic syndrome of the Korsakoff type.

(c) *Recall*.—This should be differentiated as denoting two processes of different complexity: (1) simple mechanical or sensorimotor recall, or reflex recall, and (2) recall involving voluntary effort and often proceeding along associative lines.

That recall of the second, more complex, type should fail first, before retention fails, is to be expected. This type of recall admittedly, by definition, involves the highest form of mental activity, i. e., voluntary effort, which is an activity of the ego, in contrast to the mechanical or sensorimotor type, which presupposes retention and occurs in accordance with the stimulus-response pattern so much beloved by behaviorists. This distinction seems to be confirmed not only by the experience with Korsakoff's psychosis but by the much commoner experience of fatigue or early senile loss. In both these instances, recall, for example of a proper name, may elude the subject's efforts, but recognition is readily possible. It is suggested, therefore, that in the mildest degrees of memory defect, i. e., of difficulty in remembering, it is recall that fails first, and retention usually later. To regard the process of voluntary recall as a function of a high level is also in accord with the data of psychogenic amnesia, which appears to be concerned almost exclusively with interference with the process of recall.

Epilepsy also furnishes examples of a failure of recall which gives the appearance of retention defect. It has been found by MacCurdy⁹ in persons with epileptic dementia that with effort, if the patient can be induced to make it, the capacity for remembering is much greater than formal tests would at first lead one to suppose. Nevertheless, retention is a function susceptible to physical interference. I have seen retention defect as a very early symptom of tumor of the brain. Capacity to remember a short series of digits was lacking immediately after they had been given to the patient; there was no apparent recognition when they were re-presented.

Similarly, when the patient is mildly under the influence of an anesthetic but is not yet stuporous, he can still carry on a conversation. This shows that registration and some immediate retention occur, but there may be no subsequent remembering or recognition when the facts

9. MacCurdy, J. T.: *Psychiatric Bull.* 9:187, 1916.

are afterward described to the patient. Even here, however, the presumption that retention rather than recall is affected by physical factors may be too readily made, as is illustrated by the following remarkable case that was described to me by Dr. I. G. Robin. The patient was under the care of Dr. A. F. Hurst, at Guy's Hospital.

A. C., a man aged 49, who was admitted on May 15, 1934, had at 1 p. m. on the day of admission been about to board a tram-car to go home for lunch, when he "fainted." The next thing he remembered was being in his own house, which was a ten minute ride away. His face was cut, and he had a torn coat. There was complete amnesia for that period—about fifteen minutes. There was no biting of the tongue, no headache at the time, no aura and no vomiting. The wife, when interrogated, said that there had been no evidence of any recent change in behavior. The patient's mentality was normal. The history of previous health was not important.

The patient was seen at about 8 p. m., when he was feeling well except for a slight headache in the occipital region.

Examination.—The patient appeared well. The pulse rate was 60, the temperature 98 F. and the blood pressure 140 systolic and 90.5 diastolic. The central nervous system was normal except that the pupils were irregular. The plantar reflexes were indefinite.

Laboratory Data.—The Wassermann reaction of the blood was negative. The first examination of the cerebrospinal fluid (May 17) revealed: Lange curve 0001100000, pressure 250 mm., chlorides 780 mg. per hundred cubic centimeters and proteins 0.04 mg. A second examination, eight days later, revealed: pressure 180 mm., chlorides 760 mg., proteins 0.025 mg. and a Lange curve 001210000.

Course.—On May 19 the patient was hypnotized. (He was not deeply under hypnosis, and no posthypnotic suggestions were carried.) On interrogation he stated that he remembered crossing the road to board the tram, when the front wing of a lorry "hit" him and he fell, striking his head against the tram. He picked himself up and boarded the tram; the lorry driver asked if he was all right, and the patient said "yes"; the driver did not give his name or address and has not been traced. The patient sat in the downstairs part of the car, as he always did, paid his penny fare, remembered telling the conductor that he was all right and eventually left the tram at the right stop; he then proceeded to the door of his house, about a minute's walk away. He had to hold his handkerchief to his forehead on account of the hemorrhage. Since he was holding this with his right hand, he could not reach into the pocket in which was his door key; he therefore knocked at the door; his wife let him in. She remarked on his wound and on the fact of his knocking at the door.

The patient's wife persuaded him to come to the hospital because of the "fainting fit."

The patient was allowed to recover from the hypnosis. He still remembered the facts just stated—which he had not been able to do before the hypnosis.

The patient was discharged on May 30, with complete memory and in good health.

If these facts can be accepted as complete (and nothing emerged to suggest that this was a psychogenic amnesia), this is a case in which

trauma to the brain produced a failure of memory which masqueraded as a defect of retention. Retention was, in fact, unimpaired, as was proved by the recovery of details with the patient under hypnosis. The trouble was inhibition of recall. Furthermore, there is the interesting spectacle of a psychologic process reversing a physically induced inhibition.

(d) *Time Ordering of Experience*.—One of the primary mental functions is to infuse experience with a sense of time. This private time is, of course, different from conventional time and has no direct connection with it. Its fundamental characteristic is a sense of time as a simple appreciation not of duration but of something that continuously elapses. It gives a background for other experiences and so, secondarily, comes to be responsible for sequences. There is a primary ordering of experience. The pictures stamp themselves on the unrolling time film, independent of their content.

On the basis of a conception such as this, van der Horst¹⁰ advanced an ingenious explanation of the failure of the patient with a Korsakoff psychosis to remember. He suggested that in Korsakoff's psychosis the memory defect is the result not of failure of immediate reproduction (which he declared to be often unimpaired) but of the loss of the "temporal sign" of experiences. For example, one of his patients, when given a cigar and asked about it a quarter of an hour later, replied: "I *have* had a cigar, but it was last week." In van der Horst's view, the temporal sign of a personal event depends on the time order of experience in the continuum of one's individual life, and in Korsakoff's psychosis this continuity of experience is no longer felt. In answer to the question "How long have we been talking?" the patient with Korsakoff's psychosis answers at random, although he may remember well the entire content of the conversation. Van der Horst stated that if time order is lost for current experiences the feeling for the need of it in regard to past experiences will soon be lost also—hence, also, the retrograde amnesia of Korsakoff's psychosis.

(e) *Pastness*.—I suggest that there exists as an independent function a feeling of pastness, the existence of which may be demonstrated from two kinds of experience: the feeling of *déjà vu* associated with some epileptic attacks and such an experience as that of a patient of mine who each time that she underwent an experience felt that she had a dream and that the dream, although not recollected, was the same as she had had on the previous occasion. The feeling of recapitulation of something that had happened previously was distinct and independent

10. van der Horst, N.: Ueber die Psychologie des Korsakowsyndroms, Monatschr. f. Psychiat. u. Neurol. **83**:65 (July) 1932.

apparently of the content, or at least of any conscious recollection of it.¹¹ The feeling of pastness seems therefore a distinct and isolatable experience; it is likely that loss of the capacity for it could have an effect on the total experience of remembering.

(f) *Associative Functions*.—Amnesia from lack of associative organization should be exhibited in the simplest form in early degenerative diseases of the brain, especially in the most slowly progressive types, e. g., those of senility before mechanical memory is demonstrably impaired. How far the forgetting of early senile dementia is due to restriction of interests and appetites, and how far to actual decay of the neuronic organization that presumably underlies associative memory, is a matter for speculation. In amnesias of psychologic origin the tendency is for topics associated with the pathogenic memory to be forgotten.

(g) *Imagery*.—This has already been discussed under Bartlett's schemata (page 748).

(h) *Personal Identity*.—Cases of massive amnesia in which all personal data are included are not uncommon. The patient professes amnesia not only for the events of his previous life but for all personal data, including even his own name. Nevertheless, as a rule, the automatized functions, such as the educated use of words, are completely retained. Commonly also, the social habits of an adult are also retained. (In a few cases of so-called hysterical puerilism learned habitual reactions of all kinds are also lost.)

An example of this sort was furnished by a man, apparently about 25, who was brought to the hospital by the police, having been found wandering in a London street, unable to say who he was or where he came from. He looked somewhat pale and anxious and answered all questions readily and to the point, but all that he could remember was a Latin motto and the face of a rather stern-looking man with a stubby moustache. He spoke in an educated fashion but could give no account of where he had been brought up, or indeed of anything up to the moment, a few hours before, when he had found himself in the street. With reassurance and persistent persuasion, his memory of the journey that had brought him to London was, bit by bit, brought back, till suddenly one night, at about 3 a. m., everything he had forgotten was remembered. It was then learned that he had come from a northern town, that he was in business with his father, with whom he had quarreled, principally on account of his drinking habits, and that his sudden journey to London had begun on the evening of the day of the quarrel, just after he had seen his fiancée to her home. He had had some notion of going over to the Continent, but when he reached Victoria Station he found that he had insufficient money. It then dawned on him that he was behaving foolishly. He suddenly felt confused, could not think and could not even give his name to a policeman whom he approached

11. It has been suggested by Lewis³ that the déjà vu experience is due to "a failure to actualize the present." How the pure absence of something can account for the positive experience of déjà vu is difficult to understand.

after he began to feel "mixed up" in his head. In this instance, the complex actuating first the fugue and then the loss of memory was apparent. The "stern-looking man" turned out to be his father. The Latin motto was that of the university of his native city. A reconciliation was effected in the hospital, and the patient went home to his father's house, apparently well.^{11a}

The important points in this case are: (1) the almost complete loss of memory for the events of life and even for the simplest personal data, in a setting of complete preservation of an adult personality with educated speech and action, i. e., with preservation of the automatized functions; (2) the retention of two isolated pieces of data, one of which was closely related to the precipitating situation; (3) the precipitation of the condition by an acute psychologic upset, and (4) the sudden recall of all the missing data, including those of personal identity.

A patient under my care at Guy's Hospital presented some unusual features. The loss of personal memory had persisted for three years, and a localized personal memory, for these three years only, had been built up subsequently, while all the previous data for the first forty odd years of his life had disappeared. When under mild narcosis induced with sodium n-methyl cyclohexenyl-methylmalonylurea by Dr. M. Campbell and Dr. C. H. Rogerson, the patient reenacted a war scene in which he identified those around him with soldiers. Subsequently, on gradual emergence from the narcosis, he recollected all his previous life.

The impressive points regarding this patient were: (1) the supersession of all the previous history and personal data by those of a period extending over three years only—identity being formally but not originally preserved by social constraint, as it were, since his relatives and friends continued to recognize him as the same man as before; (2) the absence of a discoverable precipitating conflict but the suggestion from the dramatic events elicited during narcosis that it was connected with the war; (3) the failure of persuasion to restore recollection, and (4) the restoration of memory during emergence from a narcotic condition.

This case makes an interesting corollary to that of Hurst and Robin, in which a psychologic process (hypnosis) undid a physically produced inhibition of recall. Here, in the case of Campbell and Rogerson, is a physiologic process (narcosis) undoing a presumably psychologically produced inhibition.

Such cases do not demonstrate the existence of a discrete factor for personal identity, apart from the recollection of events, as a component in the total process of remembering. This sense of personal identity

11a. Gillespie, R. D.: *Mind in Daily Life*, London, Methuen & Co., Ltd., 1933.

does not imply the judgment "I am the same person that . . ."; it is something elementary in which the immediate experience is felt. For more conclusive and not merely suggestive evidence for the existence of such a factor, one must turn to cases of depersonalization in which, although there is no forgetfulness, the recollected events lack the "emotion of belief" because they seem to belong to another existence or even to a different personality.

A sense of personal identity is therefore evidently not essential to mere recollection but is a distinct function, not emergent simply from the aggregation of other elements. It is a part of the complete experience of remembering, when the latter is considered in the full sense of a function of the highest level of the integrated healthy organism.

Abeles and Schilder¹² recorded cases of amnesia with loss of personal identity in a wide variety of syndromes—a schizophrenic psychosis, manic-depressive psychosis and various organic diseases of the brain (trauma to the head, arteriosclerosis and carbon monoxide poisoning) and malingering.

A case of Abeles and Schilder (one of fugue and amnesia in a man with arteriosclerotic disease of the brain) reminds one of the intimate relationship between events of the physical and those of the psychologic order in remembering. It is conceivable that the presence of an arteriosclerotic disease of the brain had produced such an impairment of the total psychophysical integration, or, in other words, such a deterioration of the personality, that a psychogenic fugue with subsequent amnesia occurred more readily than could otherwise have been possible. But this is different from saying that the organic disease produced the fugue and the subsequent amnesia. A direct cause and effect relationship between organic disease of the brain and fugue with amnesia must, nevertheless, be considered a possibility. I remember a patient of Dr. C. P. Symonds who had suffered from fugues with subsequent amnesia and in whom I failed to elicit psychologic factors (although, of course, negative results were not conclusive in those circumstances). It may be supposed that the inflammatory process in the brain had produced a disturbance of the physiologic substrata of the psychic process, such as occurs in epilepsy with automatism, and that the amnesia depended on a real failure of retention from the disturbance of cerebral conditions at the time. It is not wise, however, to assume too readily that in such instances the physical factor is the significant one.

In a case reported by Abeles and Schilder amnesia following trauma to the head was at first attributed entirely to trauma, but recurrences of amnesia (this time without the intervention of another trauma) led to

12. Abeles, Milton, and Schilder, Paul: Psychogenic Loss of Personal Identity: Amnesia, *Arch. Neurol. & Psychiat.* **34**:587 (Sept.) 1935.

the discovery of an important psychologic factor which had been operating all the time. Similarly, a tabetic patient I examined had experienced a fugue with subsequent amnesia, but neither the fugue nor the amnesia had anything to do with the underlying neurologic disease. A real emotional difficulty was the releasing factor.

SHORTCOMINGS OF CLINICAL TESTS OF MEMORY

An obvious deduction from the preceding considerations, as a whole, is that the ordinary clinical tests of memory are unsatisfactory in scope. It is not to be wondered at that they often fail to lay bare the earlier stages or the mildest degree of failure in remembering. They test either a lower level of function, that of mechanical memory, or the retention of well organized data. Neither type of test has much bearing on the most complex forms of remembering in their most recent instances—hence, the unsatisfactory nature of such tests and the greater reliability of evidence obtained from the every day life of the patient.

PSYCHOLOGIC FACTORS CONCERNED IN AMNESIA

If one assumes that registration and retention have occurred, the processes that are involved in inhibition of remembering must necessarily be concerned mainly with inhibition of recall. Recall, as has been suggested, may be side-tracked for physiologic reasons, or it may apparently be blocked, as in epileptic dementia. But the commonest mode of inhibition of recall is certainly psychologic, the process being known as repression. It has always been difficult to know precisely how repression occurs. Freud¹³ first demonstrated the importance of the process of active forgetting in a figurative way: In repression "the impulse retains its energy but no memory is left behind."

I suggest that not all amnesias are due to either simple fading or active forgetting (repression). There are other possible sources of amnesia for experiences still retained. Early mental events take place proportionately more often, for example, in visual terms, according to the evidence of recollection in psychologic analysis. More important, the schemata of the early years of infantile life and childhood are different from those of a later age. A breast is remembered not as such but as a large globular object, perhaps with softness and satisfaction associated.

Translation into the new schemata will not occur unless there is some contemporary interest in making such a translation, i. e., not because repression is at work but because there is no biologic need. Verbalization especially, which is one of the most important forms of

13. Freud, Sigmund: *Introductory Lectures on Psycho-Analysis*, English translation by Joan Rivière, London, Allen & Urwin, 1922.

this translation, may never occur. The infantile satisfactions are private; there is no need to communicate the delights of suckling.

Emotional events are likely to be intrinsically difficult to recall, whatever their nature, for several reasons. They are not translated at an early age into metaphor or words of any kind; moreover, emotional states are excessively difficult to recapture. Regarding the process of repression itself, Fenichel¹⁴ said: "Inhibition and repression are two aspects of one and the same psychologic process." They are different words for the same thing. It is agreed that repression is not a voluntary act. This was illustrated by a patient of mine in whom a particular act of forgetting took place under experimental conditions. The incident is worth recording, for the actual observation of the occurrence of an act of repression appears to be rare.

I showed the patient five objects simultaneously—a pen, a pocketbook, an inkstand, a paper clip and a pencil—and after a brief exposure I asked her to name the objects she had seen. This she did easily. On presenting the same group of objects, with a box substituted for the paper clip, I was surprised to find (for I was carrying out this experiment for another purpose) that she then could not name one of the objects. On being asked for an explanation of this curious phenomenon, she said, by the way, that she felt something had taken the memory of all the objects out of her mind. It was found that the box reminded her of a peculiarly unpleasant group of ideas (a complex the emotional tone of which was one of disgust) of a closely personal sort. The unpleasant nature of the associations with the word "box" was evidently responsible for the immediate forgetting of all the other associated objects.

It appeared that the repressing agent worked automatically: The original repressive agent was stimulated again into activity. The nature of the previously repressed material was such as to suggest that the repressing agent was of the type described by Freud as the "super-ego."

Amnesia from repression may depend on one of three processes:

1. The automatic operation of the superego, as in the foregoing instance, which occurs mainly in early life. Voluntary recall is impossible.

2. The operation of the ego itself. It appears that any experience the emotional content of which is such as to threaten self-preservation or some very valued function, such as vision, may be unendurable and that the ego seems to protect itself by repressing the memory of the experience, i. e., by failure to remember it. An example of this type of forgetting was furnished by a youthful murderer I saw, who after recounting all the incidents of the murder forgot the whole

14. Fenichel, Otto: *Outline of Clinical Psychoanalysis*, translated by Bertram D. Lewis and Gregory Zilboorg, London, George Routledge & Sons, Ltd., 1934.

episode, including his own story about it, although he sought not to escape responsibility but rather to shield his accomplice.

3. The conflict of wishes, as in the forgetting of an appointment, in which a kind of reciprocal inhibition is possible, and that wish usually wins which is more in accord with the egotistic interests. Voluntary recall is possible. This type of amnesia is the commonest in every-day life.

Amnesia may be classified on a psychogenic basis as affective, hysterical and simulated. One may distinguish an affective type of amnesia from a hysterical type. Affective amnesia may occur when the ego is threatened (type 2). For example, if a person goes through the experience of an earthquake and is subsequently found to be amnesic, I should classify his amnesia as affective. The amnesia would depend entirely on the emotional shock and would be without a discoverable motive, other than to protect consciousness from painful memories.

Hysterical amnesia, properly so called, involves something different. It involves a concept of forgetfulness as a symptom, just as a patient may have a concept of paralysis or of anesthesia. He would persuade himself and the onlookers that he could not remember, and this failure of memory would follow certain lines, just as the anesthesia would belong to the glove, stocking or midline pattern. Hence, the particular characteristics of the amnesia would depend, first, on what he had heard or read and, second, on the method by which he was examined.

Hysterical amnesia has a motive, but the motive may sometimes be far to seek, since it often depends on inner difficulties. The motive is not merely protective from a painful memory, as in the affective type of amnesia. Hysterical amnesia belongs, with elaborations due to the personality of the hysterical patient, to type 2. (I am using hysteria in the original clinically descriptive fashion and not as denoting any particular variety of mental process.)

Differentiation of Hysterical and Simulated Amnesia.—The third type of psychogenic amnesia, that due to simulation, is exceedingly difficult to differentiate clinically from hysterical amnesia. The reason for this difficulty is simple. Hysteria and simulation are the same from the symptomatic standpoint, but the reasons for their occurrence are of a different order. In hysteria the patient simulates from inner needs. He knows, at least at the beginning, that he is simulating, but he does not know why. He may realize that he wants sympathy. In simulation the patient does it to evade crude external difficulties of a contemporary kind of which he is perfectly aware. The inner needs of the hysterical patient, on the other hand, are narcissistic and infantile. The narcissism gives him a tendency to self-display, which readily

utilizes dramatic possibilities. The motive in simulation may also, indeed, be regarded as protective, but it is protective from consequences and not from memories, or in the case of compensation it is for the sake of consequences.

I suggest that all the grosser symptomatic manifestations of hysteria are the joint manufacture of the patient and the too credulous physician and that study of these gross symptoms has served only to obscure understanding of the underlying mental constitution. It is true that after a time the patient may himself come to believe in the amnesia. As a patient of mine once said: "There is a moment of conscious acceptance of the neurosis." After that, the patient believes more or less in his amnesia until some one with a strong conviction to the contrary persuades him to look again toward the memories from which he is turning away.

Since both hysterical and malingered amnesias are consciously simulated—the former at least at first—they follow the patient's concept of what amnesia should be in both instances, and there will be no distinction between the two types. Any difference between hysterical and malingered amnesia will be individual, depending on the individual patient's experience and not varying in any general way in its characteristics as between hysteria, on the one hand, and malingering, on the other. I should regard as almost certainly malingered an amnesia arising without physical cause in a patient who is up against a well known material difficulty, such as an accusation of embezzlement. The differential diagnosis between an organic and a psychogenic amnesia depends, of course, on the nature of the etiologic factor, if it can be discovered—whether it is psychologic or physical. This may involve all the diagnostic means available, from a careful history to an encephalogram and a lumbar puncture.

The type of the amnesia itself is of prime importance. If it is associated with complete intellectual capacity from its beginning, i. e., if it is without any impairment of consciousness at any time, it is probably psychogenic. If it is arbitrarily selective, inconvenient events being forgotten, it is psychogenic.

The type of recovery is almost equally significant. If this is sudden and complete, it is probably psychogenic. If it occurs by a gradual rolling up of the amnesia in an orderly fashion, it is probably due to cerebral disorder.

The extent of the amnesia—at least as far as the forms of acute onset are concerned—should be carefully investigated. It was observed by Russell¹⁵ in two hundred cases that the longest period for which

15. Russell, W. R.: Amnesia Following Head Injuries, *Lancet* 2:762 (Oct. 5) 1935.

the patient had a retrograde amnesia subsequent to trauma to the head was seven days. Anything longer than that in the way of amnesia of sudden onset is suspected of being of psychologic origin.

It is sometimes disputed in a court of law whether complicated activity of a type that would pass as normal to the onlooker is possible during a state of disordered consciousness following injury to the head. It is interesting to cite the experience of Winterstein and Guttman,¹⁶ who have recently investigated at Guy's Hospital the psychologic and the neurologic state of professional boxers. They have collected a number of instances of amnesia in boxers following a knock-out. Some have remembered the sensations in the body after the punch. Others cannot remember feeling the punch but remember having seen it. Others do not remember anything of the punch. In these cases the knock-out was complete, and the boxer remained inactive until, after a short time, memory came back gradually. But there is a second group in which the amnesia extends in retrograde fashion, from the time unconsciousness became complete. During the time which elapses between receiving the blow and the ultimate unconsciousness, the boxer is apparently capable of behaving as if he were fully conscious. Cases are on record of boxers who have been allowed to fight on and have, in some instances, won the fight, who had received a heavy punch earlier in the proceedings and had no memory of the fight from the time the punch was received. A well known boxer, when 15 years old, was caught by a punch on the chin in the first round of a fight. He went down for a short count. He regained his memory under a cold shower. He had to find out carefully what had happened. He heard that he had fought like a tiger and won through a technical knock-out in the third round. Since the fight was won ultimately, there would be, as Winterstein and Guttman pointed out, no motive for forgetting it.

The automatic activity of epilepsy with subsequent amnesia is celebrated and is commonly reputed to be capable of reaching a high level, although the activity that takes place is held to be marked by impulsiveness and lack of apparent purpose. This, if true, is in contrast to the condition of boxers who proceed to win their fight, i. e., display a high degree of purposive activity while in a state of disturbed consciousness following a blow which ultimately produced amnesia. This observation suggests that in epilepsy also there may be purposive activity relating to the ordinary life and that purposelessness is not an essential and indispensable mark of an act of automatism.

16. Winterstein, C. E., and Guttman, L. E.: Personal communication to the author.

SUMMARY

1. Remembering, in the full sense of the word, i. e., as an activity of the fully integrated organism, involves a complexity of component functions. The disintegrative processes of disease allow a number of these components to become manifest. (But one must make the reservation that what is made evident by disease may be entirely morbid and not a part of the original total process.)

2. A sensorimotor type of memory is contrasted with personal memory. That it is an activity at a lower level of integration is suggested by the experience of a disease such as the Korsakoff psychosis. The ordinary clinical tests are unsatisfactory.

3. Recall is not a uniform process but may occur either at the sensorimotor level or as a fully voluntary act. As the latter, it may be side-tracked in physical disease of the brain, or it may be blocked. A case is cited in which an apparently physically produced inhibition of recall was restored by psychologic means (hypnosis). Failure of recall is often mistaken for failure of retention.

4. The time ordering of experience may be a primary mental function, and loss of it may explain some defect in an amnesic symptom complex, such as Korsakoff's.

5. A feeling of pastness is suggested as a component function in remembering.

6. The "emotion of belief" (Russell⁴) is an essential attribute of memory. It is composed of the feeling of pastness and the sense of personal identity.

7. Psychogenic amnesia is dependent mainly on failure of recall. Inhibition of recall may result from the activity of the ego itself, either as self-protection from the memory of experiences of shock intensity or as the result of a conflict of wishes. Inhibition of recall may also be the result of the operation of the superego, acting on experience, real or fantasied, embodying a feeling of guilt. The automatic occurrence of an act of forgetting under experimental conditions is described.

8. Gross amnesia of the hysterical type is clinically not distinguishable, by mere inspection alone, from simulated amnesia, since both depend on the individual patient's idea of what amnesia should be. Hysterical amnesia is held to be a conscious simulation for inner needs, while malingered amnesia is simulated for some occasional material advantage.

9. From a medicolegal standpoint the following observations are important:

- (a) Hysterical amnesia often begins at the end of a fugue, consciousness having been maintained up till that time.

- (b) When consciousness has been disturbed by a trauma to the head for a period for which there is subsequent amnesia, a high grade type of performance has been demonstrated to be possible during the time for which there is subsequent amnesia.
- (c) Retrograde amnesia may occur after epileptic attacks and may stretch back long before the time when consciousness was disturbed by the epileptic seizure itself.¹⁷
- (d) Amnesia for criminal acts is not to be accepted as anything but malingered (in the absence of physical disease of the brain) unless it conforms to the type described as resulting from experience of shock intensity.

17. Steinmann, Inge: Ueber protrahierte Amnesien bei echter Epilepsie, *Ztschr f. d. ges. Neurol. u. Psychiat.* **148**:211, 1933.